

**UTAH RENEWABLE ENERGY INITIATIVE FOCUS
GROUP**

**DRAFT REPORT
OCTOBER 12, 2007**

**FOR SUBMISSION TO THE
GOVERNOR’S BLUE RIBBON ADVISORY
COUNCIL ON CLIMATE CHANGE**

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TABLE OF CONTENTS

TABLE OF CONTENTS.....	2
EXECUTIVE SUMMARY & RECOMMENDATIONS.....	3
REI FOCUS GROUP DESCRIPTION.....	7
The Renewable Energy Initiative (REI) Focus Group Purpose.....	7
REI Focus Group Membership	7
REI Focus Group Work Schedule and Study Scope.....	7
REI Focus Group Work Plan	7
REI FOCUS GROUP RESULTS	9
Benefits to Renewable Electrical Energy Development.....	9
Barriers to Renewable Energy Development.....	9
Additional Policies and Factors that Can Affect Renewable Resource Development .	10
DESIGN AND NEED FOR A UTAH RENEWABLE PORTFOLIO STANDARD	11
Utah “Strawman” RPS and Design Features	13
CREDITS AND INCENTIVES.....	27
TRANSMISSION AND DISTRIBUTION SYSTEM ACTIONS	28
Establish a Utah infrastructure authority	28
Create Renewable Energy Development Zones.	28
Allow Cost Recovery for Transmission Development & Scoping Costs	28
California Renewable Energy Transmission Initiative	29
Create Incentives for a Smart Electrical Grid	29
Create Incentives for a Energy Storage	30
APPENDIX 1: REI FOCUS GROUP PARTICIPANT LIST	32
APPENDIX 2: LIST OF PRESENTATION AND DISCUSSION TOPICS	35
APPENDIX 3 – SUBGROUP DISCUSSION SUMMARIES	36
Definition of Renewables Subgroup.....	36
Cost Effectiveness Subgroup	36
APPENDIX 4 – 17 QUESTIONS TO ADDRESS WHEN CONSIDERING AN RPS ...	37
OREGON RPS CASE STUDY	39
APPENDIX 5 – TAX CREDITS AND INCENTIVES.....	40
Federal Incentives	40
State Incentives - Utah	40
APPENDIX 6 – WYOMING INFRASTRUCTURE AUTHORITY	43

EXECUTIVE SUMMARY & RECOMMENDATIONS

As directed by Utah Governor Jon Huntsman Jr., the Renewable Energy Initiative (REI) Focus Group was formed in June 2007 as a technical sub-group of the Governor's Blue Ribbon Advisory Council on Climate Change (BRAC). Per the Governor's instructions, the purpose of the REI was to develop a group of proposed public policy actions that can be taken to help develop cost-effective renewable electrical energy resources for the State of Utah.

The REI Focus Group consisted of representatives from a wide range of stakeholders, including state environmental, energy, and regulatory agencies; public and investor-owned utilities; environmental and health advocacy organizations; renewable energy developers; financial and legal firms; academic institutions; and other interested parties. The first meeting convened on July 9, 2007, meeting every week thereafter for 2-4 hour periods, with the goal of submitting its report to the BRAC on October 19, 2007.

Throughout the entire process, staff from Utah Division of Air Quality have been central to the effort's organization, providing meeting locations and necessary visual and audio equipment; taking minutes at every meeting; disseminating all information relevant to the process; compiling summaries of presentations and updating lists of participants; maintaining the REI webpage; receiving and compiling literally hundreds of comments letters from REI participants and the public.

Because the REI Focus Group was given a very tight timeframe with which to complete its charged task, it was recognized that the scope of discussions and subsequent study and proposals would have to be maintained at a relatively high level in terms of detail. The group also realized that any effort to advance renewable energy development in the state would likely involve many varied public policy actions that, in some cases but clearly not all, could be difficult and political in nature.

At the start, the REI Focus Group completed simple exercises to identify economic, regulatory, and technology forces that would encourage or discourage renewable energy development. As a result, a list of benefits, barriers, and policy options were developed. Some of the benefits derived from more renewables included:

- diversification of Utah's energy portfolio (currently fueled by mostly coal and some natural gas) to hedge against fossil fuel price volatility and possible carbon taxes or caps, while improving energy independence and security,
- improve air quality by reduced pollutant emissions,
- reduction in CO₂ emissions and Utah's greenhouse gas footprint,
- encourage economic development, stabilize electric prices, and help assure plentiful electric resources.

Some of the barriers to renewable energy development included:

- Higher costs in some cases (by using traditional utility cost analysis) due to economies of scale, upfront capital costs, varied capacity factors, development risks, and technological or market constraints,
- A lack of transmission in areas where certain renewables have a high potential, therefore acting as a hindrance to project development,

- The need to mix some renewable sources with other sources in order provide baseload capacity, incurring extra challenges for transmission grid operators.

This was followed by several presentations in order to educate the group on the pertinent issues related to policy options. Out of this exercise, two subgroups were formed; one to explore what resources could be defined as renewables and one to help define cost effectiveness with regards to resource supply.

Finally, an expanded list of state-level issues, programs, and policies were developed. From this list, the group made a consensus-based decision, in light of the time constraint, that three initiative efforts central to the larger effort would be further evaluated. These three issues are:

- 1) a renewable portfolio standard (RPS) for Utah
- 2) Incentives for renewable resource development
- 3) Enhancement of the transmission and development system

Renewable Portfolio Standard – An RPS is a requirement that utilities must supply a fixed percentage of electricity sold to the utility’s customers from an eligible renewable energy source. Currently 25 states and the District of Columbia have adopted Renewable Portfolio Standards. Again, in light of the tight schedule for the REI, it was decided that the group would 1) examine the recently passed Oregon RPS as a way to quickly educate the group members on the details of what entails an RPS, and 2) develop a “strawman” document based loosely on the Oregon model as way to expedite and facilitate group discussion on a possible Utah RPS.

There was general recognition among the group that an RPS could advance renewable energy resources, but participants had divergent views about whether Utah should adopt an RPS. Some participants felt that an RPS should be adopted as soon as possible, others felt additional studies must be conducted, and still others felt an RPS was unnecessary. There was consensus that the use of Renewable Energy Certificates (RECs) could be used to measure compliance, but who would be responsible for the certification of such RECs remained unsettled. In addition, the trading of RECs, both bundled and unbundled, by participating utilities would be allowed but it was agreed that changes to the regulatory framework may be needed before unbundled RECs can become a useful compliance mechanism. There was consensus that recovery of prudently incurred costs and the implementation of cost caps are necessary. And finally, the use of Alternative Compliance Payments could be an acceptable form of meeting RPS requirements, with the caveat that certain changes may be needed to the regulatory framework.

There was disagreement on several key issues, with the acknowledgement that additional work may be needed to address these issues. Areas of disagreement included whether RPS targets should be mandatory verses voluntary. There was also disagreement on the specified targets for an RPS, with some believing that they needed to be more aggressive while others supported less aggressive targets. Some of Utah’s smaller energy providers expressed concern over meeting RPS targets without specific plans to increase generation resources in coming years.

There was consensus that qualifying renewable resources for an RPS should include wind, solar, geothermal, specific types of biomass, and some hydroelectric. There was disagreement, however over how much hydroelectric would be considered as qualifying resources. In addition, it was considered that the qualifying date of existing hydro facilities for inclusion in an RPS be determined by those built after January 1, 1995, which is similar to Oregon's RPS. This point did not achieve consensus, however. Some individuals argued that additional types of low-carbon emitting resources should be considered as renewables, but the group did not reach agreement on any additions.

Incentives for renewable resource development – Most states, including Utah, have already implemented various tax credits and incentives to assist in renewable resource development. But the REI Focus Group agreed that additional such programs should be considered and that such incentives should be extended in order to be consistent with planning horizons and implantation schedules of any proposed RPS targets. A list of these additional proposals is provided in the full report.

Enhancement of the transmission and distribution system – Inadequate transmission infrastructure and siting delays and complications are two significant barriers to all new centralized generation from renewable resources in Utah. To help familiarize the group with such issues, a presentation was given by a representative from the Wyoming State Infrastructure Authority. An ensuing discussion produced a recommendation that Utah consider the establishment of its own transmission authority. No specific action was taken on this recommendation, however

There was wide consensus that improvements in the state's transmission infrastructure could be partially aided by the establishment of renewable energy development zones (REDZs), a concept that had previously received support from the BRAC. The example of California was cited, where efforts are already underway to explore REDZs in conjunction with improved transmission infrastructure to provide additional renewable electricity to customers by 2020.

It was suggested that utilities be assured cost recovery for the development and scoping required for transmission that would serve renewables, but that a study of impacts to electrical rates be undertaken in order justify such incurred costs.

Finally, there was consensus that the development of renewable resources would benefit by implementing smart electrical grid technologies and that many such technologies already exist today. It was suggested that such grid improvements could improve operational security, allow increasing amounts of distributed renewable energy near load demand, and allow the two-way flow of energy and data to better facilitate customer response to price signals and the need for load reductions during peak hours.

Because of the lack of time to explore other relevant issues, the REI Focus Group is recommending additional studies for the following items:

- REDZs and how best to implement them
- how an RPS would affect rates
- a cost quantification study on externalities associated with traditional electrical energy sources
- what changes are needed to state utility regulations to help facilitate more renewable resources
- the potential capacity and benefits from distributed generation near load demand
- the benefits of a parallel grid and how it could be best implemented

Lastly, the co-chairs would like to express their sincere gratitude to all members of the REI Focus Group for their diligence and hard work in this fruitful effort. We extend our particular thanks to UDAQ staff for their incredible professionalism and extraordinary commitment in assisting this process. Finally, we want to thank Governor Jon Hunstman Jr. and his energy advisor Diane Nielson for this tremendous opportunity.

REI FOCUS GROUP DESCRIPTION

The Renewable Energy Initiative (REI) Focus Group Purpose

The Renewable Energy Initiative (REI) Focus Group was organized in late June 2007, as a technical group for the Governor's Blue Ribbon Advisory Council on Climate Change. The purpose of the Initiative is to develop detailed public policy actions that can be taken by state government and other leaders to increase the development of cost effective renewable energy resources within the electric sector.

The reasons cited for pursuing more renewable energy are:

- Enhancement of Energy Security and Resource Diversity
- Reduction or Avoidance of Greenhouse Gas Emissions
- Improvement of Air Quality
- Encouragement of Economic Development

REI Focus Group Membership

The group consisted of representatives from a wide range of stakeholder groups, including state environmental, energy, and regulatory agencies; public and investor owned utilities; environmental organizations; renewable energy developers; financial and legal firms; academic organizations; and other interested parties. Meetings were open to the public, so attendance varied from meeting to meeting. See Appendix 1 for a list of participants, based on signed attendance lists from the various REI group meetings.

REI Focus Group Work Schedule and Study Scope

The group first met on July 9, 2007, and was tasked to submit its report to the Governor's Blue Ribbon Advisory Committee on Climate Change (BRAC) before October 19, 2007. Due to the time constraints, the group met every week for 2-4 hours during the period of July 9 – October 12, 2007.

REI Focus Group Work Plan

The REI Focus Group utilized the following work plan:

- The group completed some exercises to identify high level economic, regulatory, and technology forces that either encourage or discourage renewable energy project development within the state of Utah. From this work, the group identified benefits of renewable energy resources, barriers to renewable energy development, and an initial list of policy options to consider.

- Presentations and subsequent discussions were scheduled over the next four weeks to educate the group on the renewable energy marketplace, different generation technologies, various policy options, and related utility regulatory and cost recovery issues. See Appendix 2 for a list of the topics covered in this phase.
- Two subgroups were created to develop a state definition of renewable energy and a definition of cost effectiveness. Summaries of the subgroup discussions are provided in Appendix 3.
- The group then developed an expanded list of state-level issues, programs and policies affecting renewable energy development.
- From the expanded list, three initiative areas were selected for more detailed discussions. They included:
 - Renewable portfolio standard
 - Incentives to foster renewable energy project development
 - Enhancement of the transmission and distribution system

REI FOCUS GROUP RESULTS

The following paragraphs summarize the results of the REI Focus Group discussions.

Benefits to Renewable Electrical Energy Development

The following reasons were identified for developing more renewable electrical energy resources to supply Utah's electrical energy needs. Renewable energy resources:

- Diversify Utah's electric generation resource portfolio, which is currently fueled predominantly by coal and natural gas.
- Help mitigate the impact of future increases and volatility of fossil fuel prices because they are fixed-price resources.
- Help improve energy independence and security.
- Have low or reduced carbon emissions, and are not subject to future carbon regulation, thereby reducing the risk to Utah's consumers.
- Improve air quality.
- Provide new economic development opportunities.

Barriers to Renewable Energy Development

The REI Focus Group identified the following barriers to the development of renewable electrical energy resources:

- Renewables are often perceived as too expensive or risky:
 - When using traditional electric utility regulatory cost analysis methods, most types of renewables are more expensive or have a higher development risk compared to other types of generation technologies. The group agreed this is due largely to lower economies of scale, higher capital costs, lower generating capacity factors, increased development risk (i.e., in particular for geothermal field exploration), and technological/market maturity of some technologies.
 - Traditional electric utility cost analysis models do not take into consideration external costs (or externalities). Some argued that renewables actually would be more competitive compared to traditional generation resources if all of the external costs are considered. Examples include a project's cumulative impact on air quality, public health, water scarcity, greenhouse gas emissions, and land use impacts. Others argued that if externalities were to be addressed, the impact on the economy resulting from higher energy prices would also need to be considered.
 - However, there was no consensus on which externalities should be considered in setting utility rates. Such externalities, are often difficult to quantify, value financially, and consistent methods to include or consider these costs in utility rates have either not been developed or have seen limited use during utility planning and resource procurement.

- There was consensus that, in the near future, there will be additional costs associated with the generation of electricity from fossil fuel resources. This additional cost may be in the form of a carbon tax or new compliance costs associated with a carbon dioxide cap and trade program. Thus, making renewables more cost competitive with traditional fossil fuel resources.
- Some renewables are uneconomical to develop. Geographic regions that hold the highest potential for renewable resource development often are located many miles from major population centers, and frequently are not located near existing transmission lines that could carry the renewable power to markets. New transmission lines and associated electrical infrastructure are often difficult to justify for a single project. Such new investments are costly to build and usually take many years to design, obtain rights of way and permits, and construct.
- Some renewables are intermittent generators, meaning they cannot be dispatched when the power is needed by the local utility. Rather the power is available on an intermittent bases. The overall grid system must be developed properly to account for intermittent resources, to ensure that the utility can meet customer demands when the renewable resources are not available and that system frequency, voltage, and grid reliability standards are met. Enabling technologies, such as energy storage, need to be developed to overcome operational challenges created by intermittent renewable resources.

Additional Policies and Factors that Can Affect Renewable Resource Development

The REI Focus Group identified the following economic and regulatory conditions, policies or programs which influence how much renewable electrical energy resources will be developed:

- Whether a (public or investor owned electric) utility can achieve full and timely recovery of renewable energy resource and related infrastructure costs without creating unacceptable price increases to its customers.
- Whether new resources are necessary and if so when, so the utility is not obligated to add renewable generation when it does not need the output to serve its customers.
- Whether conservation, load shaping, demand side management, or other measures are economically and operationally more cost-effective than adding new renewable generation resources.
- Whether policy mandates create supply restrictions or distorted prices reducing the availability of cost effective renewable generation, or do policy mandates create positive market forces that result in a robust renewable energy market with competitive prices.
- Whether the state should specify the quantities of various types of generation that a utility should have in its portfolio, such as renewable energy and low/zero

carbon emissions energy. This is often accomplished by implementing portfolio standards (i.e., such as a renewable or a clean energy portfolio standard).

- Whether a package of streamlined site study and selection processes, permitting, tax and other economic incentives exist that will facilitate the development of renewable energy projects in a specific location in an efficient and timely manner. This might be accomplished through the creation of renewable energy economic development zones, similar in concept to economic development zones that have been created to encourage commercial and industrial development in many Utah locations.
- Whether prices and net metering policies allow the energy output from renewable projects (including distributed generation) to be sold to the host utility at a price that is both attractive to the owner and still cost-effective to the utility ratepayer.
- The existence of green power purchasing and marketing programs, giving customers the choice of purchasing electricity from renewable sources or of paying into a fund that the utility will use develop renewable generation resources.
- The removal of transmission and other infrastructure barriers that discourage the development of renewable energy resources
- The degree to which the transmission and distribution system is modernized and strengthened to support large or distributed renewable energy resources. Technical considerations include transmission capacity, system control and stability issues, and ease of interconnection between suppliers and the transmission system.
- Government approved or provided incentive programs. Tax credits can spur development, as can utility rebate or buy-down programs. State grants, such as those provided for economic development projects, can also boost development.

DESIGN AND NEED FOR A UTAH RENEWABLE PORTFOLIO STANDARD

A Renewable Portfolio Standard (RPS) is a requirement that utilities must supply a fixed percentage of electricity sold to the utility's customers from eligible renewable energy sources. Currently 25 states and the District of Columbia have adopted Renewable Portfolio Standards.

On May 8, 2007 Dr. Ryan Wiser, Lawrence Berkley National Laboratory, gave a symposium on Renewable Portfolio Standards to the Climate Change Stakeholder Working Group of the Governor's BRAC. A summary of that symposium was given to the REI Focus Group by DAQ Staff. The key findings from the symposium were:

- Expected cost of state RPS policies is typically modest; benefits are not insignificant
- A state-specific cost-benefit study can be helpful in educating stakeholders

- Actual RPS costs in most states have, in general, been relatively low
- Cost caps and RPS design can be tailored to avoid some adverse cost impacts
- But... it is true that an RPS *may* increase retail electricity rates

The REI Focus Group decided it was necessary to study potential design features of an RPS before considering whether Utah should adopt an RPS. In order to use limited meeting time efficiently, the focus group asked Kyle Davis of PacifiCorp to present a case study of the Oregon RPS legislation and the process that was used in Oregon to develop their RPS. Mr. Davis also provided a set of 17 questions to address when considering an RPS, which were initially presented during testimony offered by Brent E. Gale, Sr. Vice President, Regulation and Legislation, MidAmerican Energy Holdings Company to the Utah Legislature's Public Utilities and Technology (PUT) Interim Committee on June 20, 2007. This approach helped the REI Focus Group to identify key design issues for possible inclusion in a Utah RPS, while also taking into consideration the important differences between Utah and Oregon's needs. See Appendix 4 for a list of the 17 questions and the Oregon RPS case study.

In general, the REI focus group concluded that if a Utah RPS is implemented, it must be carefully designed, with the right balance of features, in order to be of value. While the REI focus group was able to identify some features that probably should be included, it was not possible to complete the balancing of the various features in the few weeks available to the group. In comparison, the development and balancing effort in Oregon took over a year of intense work by many stakeholders and policy makers. Even after the year of work, some decisions were decided by the Governor or during the political process in the legislature.

Renewable Portfolio vs. Low Carbon Portfolio

Staff from Rocky Mountain Power/PacifiCorp asked whether the goal of the group should be to establish a clean energy or low carbon portfolio standard, or if the goal was focused exclusively on a renewables portfolio standard. The group was told that no additional guidance had been provided by the Governor other than it should result in a policy that significantly contributes to the commercialization of renewable energy resources within the state of Utah. Rocky Mountain Power/PacifiCorp then suggested a portfolio standard based upon carbon might be more appropriate, especially since existing RPS states have now turned their focus to CO2 reductions and that Utah recently joined the Western Climate Initiative. Also, the utility argued, renewables would be highly incentivized and could even be mandated, within an appropriately designed low carbon portfolio standard. In the end, the REI Focus Group decided, given the brief amount of time before having to deliver a recommendation to the BRAC by mid-October, it was easier to focus the discussions on design criteria for a traditional RPS.

Utah clean energy commented that focusing on a renewable portfolio would adequately address the greenhouse gas reduction objective of this initiative.

Mandatory vs. Voluntary Targets

Background: There was considerable debate about whether an RPS is even necessary.

Discussion:

There was robust discussion on the role of Mandatory vs Voluntary targets in which consensus could not be found.

Outcome:

All of the utilities (and public utility member governments), UAE, and the CCS believe that voluntary targets are sufficient to meet the REI objectives and are the preferred course of action. However, advocates, renewable energy developers, academics, Salt Lake City, Salt Lake County and citizen groups believe mandatory targets are required to meet the REI goals and are a necessary means to address externalities.

Comment [Gms1]: DAQ: “renewable energy advocates”

Comment [Gms2]: UAE: “some citizen groups”

Issues to be Addressed

If there is to be a Utah RPS, the REI Focus Group identified the following issues that need to be addressed (please note level of support in parentheses following each item):

- The cost-effective (least-cost/risk-balanced) standard (RMP, DPU, CCS, UREA, UAE)
- Before Alternative Compliance Payments (ACP) and unbundled RECs can become a compliance mechanism, changes may need to be made to regulatory framework (consensus)
- System reliability (consensus on the issue, but no consensus on the amount of intermittent resources that trigger reliability issues)
- The legal structure and governance of the utilities and the impact on RPS design (consensus)
- Encouragement of renewable resources while minimizing adverse market distortions (consensus)
- Analyze and address the economic/rate impacts (positive and negative) of instituting an RPS (consensus on this issue, but no consensus on the timing of the study)
- Project eligibility needs to be determined and needs to address resource type, vintage (i.e. commercial operation date), and geographic location criteria (consensus).

Comment [Gms3]: •RMP: Intermittent, non-dispatchable resources can create system reliability issues, a study needs to be conducted to determine the amount of intermittent resources that can reasonably be added prior to causing reliability issues (consensus on the issue, but no consensus on the amount of intermittent resources that trigger reliability issues).

Comment [Gms4]: Recommended change: “... but no consensus on whether this needs to occur before or after legislation is passed).

Utah “Strawman” RPS and Design Features

During the REI’s RPS discussion, Utah Division of Air Quality staff prepared a Utah “strawman” document that listed the various RPS design features based loosely on the Oregon RPS, which the REI focus group used to guide its discussion.

The following section includes the RPS strawman design features that were considered by the REI focus group (gray boxes) and group comments and conclusions concerning those features. The strawman design features listed in the following section are included for discussion purposes only. The REI Focus Group concluded that any specific final parameters must be set after careful analysis and through the interaction of many stakeholders during the shaping of actual legislation. It is expected that Utah policy makers will establish a process to develop final RPS legislation, if Utah policy makers decide that an RPS is necessary.

A) Preliminary Target

Background: A Renewable Portfolio Standard (RPS) is a requirement that utilities must supply a fixed percentage of electricity sold to the utility's customers from eligible renewable energy sources. An RPS is typically expressed in terms of a percentage target of renewable energy to be reached by a certain point in time.

STRAWMAN:

Investor Owned Utility (IOUs):	20% by 2020
Municipalities:	5-10% by 2020
Rural Electric Co-ops:	5-10% by 2020

Targets for Municipalities and Co-ops that currently have a surplus in energy will not be applicable unless new resources are acquired.

Annexing of IOU service territory by Municipalities or Co-ops without consent, will trigger full (IOU) RPS targets.

Discussion:

- A Utah RPS that includes public power entities may present governance concerns, especially related to any enforcement or oversight provisions.
- Rocky Mountain Power expressed concern that there should be equitable treatment of all electricity customers, and that a renewable energy target be applied to all electric corporations and municipal electric utilities, ensuring that all Utah consumers receive the benefits of the standard regardless of the ownership of the utility serving them• Some participants believed the RPS should include not just an energy requirement, but also a demand requirement (e.g. 3% of the utility's demand must be met with renewables by 2015), so that the mechanism fosters renewable and other technologies that can overcome limitations associated with intermittent renewable resources.
- Utilities representatives objected to mandatory strawman targets and indicated that they could not commit until they had seen the remaining terms and conditions.

- Some participants stated that the strawman targets were not ambitious enough.
- Some participants felt that target values must be set very carefully, with detailed analysis and system modeling of the Utah specific situation on a utility-by-utility basis. In particular, some participants expressed concern about the cost effectiveness of varying levels of renewable resources and the technical potential of reaching the strawman targets.
- Rocky Mountain Power indicated that the company was currently required to identify and pursue the acquisition of the least cost/risk balanced portfolio of resources and to the degree that renewable energy resources were the least cost/risk balanced they would be acquired. If renewable energy resources acquired to satisfy a target do not represent least cost/risk balanced acquisition, the acquisition would either increase the cost or risk to the company's customers.
- Rocky Mountain Power observed that it is in the process of adding considerable new generation resources (1400 MW by 2012 and 2000 MW by 2013), and has committed to add wind and geothermal resources as part of the commitments that Mid American Energy Holdings Company made as part of its acquisition of PacifiCorp.
- Some public power entities do not expect to add generating resources for at least several years, and are small enough that it may be impossible for them to add renewables without also adding expensive gas-fired peaking generation that would operate when the renewables were not available.
- Some public power entities objected to the provision that annexation of IOU service territories without consent would trigger IOU RPS targets, stating that provision is counter to current process and practice for annexation and would lead to additional and unnecessary complexity.
- Some participants felt that renewable targets should be selected in a manner that is consistent with Utah's eventual CO₂ reduction targets under the Western Climate Initiative.
- Some felt that targets and interim milestones should be established and approved at the final resource planning point for a given year, and consideration should be given to use of three or five year rolling averages for establishing actual compliance.
- Others felt that targets and interim milestones could create market distortions which would result in an increased cost for renewables.
- Some participants recommended that the selection of the renewables targets be established after the definition of qualifying renewables and other components of the RPS are finalized.
- Rocky Mountain Power suggested the alternative of a clean energy or low-carbon portfolio standard, noting that existing RPS states have now turned their focus to CO₂ reductions.
- All felt a standard should allow electric corporations and municipal electric utilities to meet the target with owned renewable energy sources, power purchases of qualifying electricity, and renewable energy certificates

Outcome: *Please see summary table below:*

Opinion	Supporters ¹
More Aggressive (i.e. greater than 20% by 2020)	UCE, SC, SLC, WW, WRA, Interwest, Utah Moms, SunEdison, enXco, WCAC, SE, WWW, SLC
Less Aggressive (i.e. lower target or voluntary approach)	RMP, UAMPS, UMPA, UREA, UAE
Resource type based on % carve-outs ²	UCE, SC, SLC, WW, WRA, Interwest, Utah Moms, SunEdison, enXco, WCAC, SE, SLC
Resource type based on cost-effectiveness	RMP, UAE, UREA, UAMPS, UMPA, CCS
Target should be set after some studies and other design features	DPU, UAE, RMP, UAMPS, UMPA, UREA
Standard based on carbon reduction (energy efficiency, DSM, etc)	RMP, ASP, UREA, UAMPS, UMPA, UAE

Comment [Gms5]: WRA: “and/or should also include demand targets)”

Comment [Gms6]: RMP: qualification

Comment [Gms7]: RMP: Portfolio standard account for avoided carbon emissions (energy efficiency, DSM, etc)

B) Definitions of Renewable Energy Resource

Background: Which resources qualify as renewable is a matter of some debate. For example, renewable energy is defined differently and for different purposes in separate sections of Utah State Code. For the purpose of an RPS, the issue of qualifying renewables must be addressed.

STRAWMAN:

As a minimum, renewable energy resources should be defined in accordance with existing Utah statute, to include biomass energy; certain qualifying hydroelectric energy, geothermal energy, solar energy, and wind energy. In addition, any RPS legislation should allow for other resources to be defined as renewables by a state

¹ The following abbreviations are used for stakeholders throughout this section: CCS-Committee of Consumer Services, RMP-Rocky Mountain Power, DPU-Division of Public Utilities, UAMPS- Utah Associated Municipal Power Systems, UMPA-Utah Municipal Power Agency, UAE-Utah Association of Energy Users, UCE-Utah Clean Energy, SC-Sierra Club, SLC-Salt Lake City, UREA-Utah Rural Electric Association, WW-Wasatch Wind, WRA-Western Resource Advocates, ASP – Applied Science Professionals LLC, SE – Shoshone Energy, WCAC – Wasatch Clean Air Coalition, WWW – West Wind Wires.

² A “carve-out” refers to setting specific targets for certain types of resources (e.g. 2% target for solar electricity).

wide governing body such as the Public Service Commission, State Energy Program, or Department of Environmental Quality.

Biomass energy means any of the following that is used as the primary source of energy to produce fuel or electricity:

- material from a plant or tree; or
- other organic matter that is available on a renewable basis, including:
 - slash and brush from forests and woodlands;
 - animal waste
 - methane produced at landfills or as a byproduct of the treatment of wastewater residuals;
- aquatic plants; and
- agricultural products.

Biomass energy does not include

- black liquor
- treated woods; or
- biomass from municipal solid waste other than methane produced at landfills or as a byproduct of the treatment of wastewater residuals.

Discussion:

- Some participants argued that the design of the portfolio standard or the list of qualifying renewable resources should recognize other low-carbon emitting, and otherwise environmentally low-impact resources such as demand side management, improved plant efficiency, combined heat and power, and other actions that avoid emissions of CO₂ into the atmosphere. These types of resources could be just as effective in helping Utah achieve its CO₂ emission reduction and other targets as the resources that presently qualify as renewables. Some states have sought to tap this potential resource by setting a percentage target for energy efficiency, demand-side management or other measures as part of their RPS legislation or rule making.
-
- Some participants felt that only certain hydroelectric power projects should qualify.³
- Public power entities objected to qualifications or limits on the inclusion of hydroelectric power.
- Emery Energy felt that Municipal Solid Waste (MSW) should be included as a biomass feedstock that qualifies as renewable energy. They suggested that it may be appropriate to include the following qualifying language: “MSW Facility must use a non-combustion

³Some states limit the types or vintage of hydroelectric power that qualify towards meeting their RPS targets. For example, a state may limit qualifying hydroelectric power plants to those built after a certain year or to small or run-of-river plants.

Draft Report – October 12, 2007, 2007

- therma lprocess (i.e. gasification) to convert MSW to a clean burning fuel to generate electricity.”
- Some participants felt that MSW should not be included due to concerns that it will diminish efforts to reduce waste streams and promote recycling. Some also expressed concerns regarding emissions/waste that may result from the use of MSW to generate electricity.
 - Some participants believed that biomass projects which use plant or tree material should be limited to true waste material (i.e. no deforestation for fuel), with net zero or negative CO₂ emissions

Outcome: *Please see summary table below:*

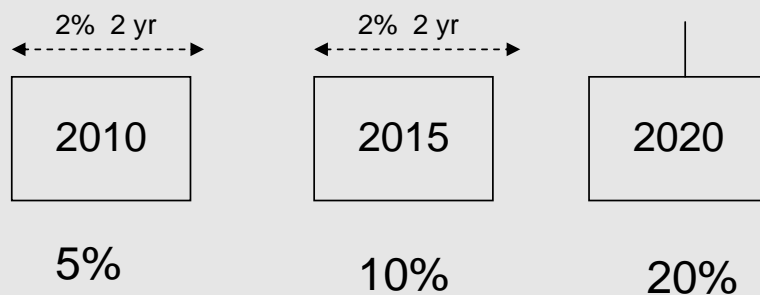
Opinion	Supporters
Current Statute w/Qualified Hydro	UCE, SC, SLC, WW, WRA, Interwest, Utah Moms, Sun Edison, DPU, WCAC, WWW, SLC _o
Current Statute w/All Hydro	UAMPS, UMPA, UREA, UAE

C) Compliance

Background: In some instances, an RPS may include interim milestones or goals along the way towards meeting an ultimate target. Such milestones can be fixed or can include provisions that allow more compliance flexibility.

STRAWMAN – Compliance:

Beginning in calendar year 2010, investor-owned utilities would be required to reach the following milestones:



There would be a 2%, 2 year compliance window for 2010 and 2015 milestones to prevent artificial markets (i.e. a utility would be considered in compliance if they were within two percentage points of the milestone target within +/- two years of the milestone year). However 2020 would be a hard target.

Municipalities and Co-ops do not have intermediate milestones.

Compliance will be met and verified on the basis of Renewable Energy Certificates.

Discussion:

- Several participants indicated that it is very important to have flexibility in meeting the compliance targets, due to uncontrollable events such as weather, equipment availability, natural disasters, market conditions, or utility system loads.
- Some participants felt that targets and interim milestones should be established and approved during the final resource planning process for a given year, and that consideration should be given to use of three or five year rolling averages to verify actual compliance.
- Others felt that targets and interim milestones could create market distortions which would result in an increased cost for renewables. Also, they pointed out that interim targets could require retirement of renewable energy certificates that could otherwise be sold to benefit customers.
- Some participants felt that it is arbitrary to establish interim milestones without study of when renewable resources might feasibly be brought online; however, other participants felt that such a study will not accurately reflect renewable resource potential since project developers may be waiting for an RPS before announcing their projects.
- Some participants felt it was reasonable to require electric corporations and municipal electric utilities to file interim compliance plans and a final compliance report; electric corporations would file with the Public Service Commission and municipal electric utilities file with the department of environmental quality (DEQ);
- Some participants noted that costs caps (section I below) could be used to protect against the cost of compliance in the face of unanticipated events.
- Some participants felt a target need not be satisfied to the extent it would require acquisition of electricity in excess of a utility's load requirements or substitution of qualifying electricity for electricity from generation sources owned and contractually committed

Outcome: *Please see summary table below:*

Opinion	Supporters
Interim Hard Targets	UCE, SC, SLC, WW, WRA, Interwest, SunEdison, SE, enXco, WCAC, WWW, SLCo
Flexibility in Targets	RMP, UAE, CCS, UREA, UAMPS, UMPA

D) Renewable Energy Certificates

Background: Renewable Energy Certificates (RECs) serve much the same functions as commodity futures contracts that are bought and sold between parties without the underlying actual quantities of the commodity being physically moved between buyer and seller until the final delivery. Bundled RECs are RECs that are always bought or sold along with the energy itself that has been produced by a renewable generation resource, from the point of creation to the point of final consumption. Unbundled RECs are RECs that have been administratively separated from and bought and sold independently of the actual energy.

STRAWMAN:

In order to demonstrate compliance with the RPS requirements, an electric utility must provide proof of having obtained or produced the qualifying electricity (or its environmental attributes) and having delivered it to its customers. This proof is accomplished through the creation of a market tracking mechanism that follows the creation, market transactions, and eventual retirement of renewable energy units using RECs. Electric utilities are allowed to use both bundled and unbundled RECs within the Western Electricity Coordinating Council (WECC).

If a utility purchases a bundled REC, the electrical energy associated that bundled REC must also be delivered to the utility. But in the case of an unbundled REC, the actual electric energy from a renewable resource can be “swapped out” for non-qualifying electricity (e.g., from natural gas or coal) as it makes its way to the final destination, with the utility’s total purchased and retired RECs demonstrating that the right amount of renewable energy was produced to meet the utility’s RPS requirement. By allowing for the use of unbundled RECs, utilities can gain the flexibility of using non-qualifying electricity to “shape” or “firm” wind power and other intermittent power resources, as long as the total number of RECs that are purchased and retired by the utility equal the renewable energy percentage of total electrical energy sales specified by the RPS.

For IOU’s, the Oregon RPS requires that no more than 20 percent of their compliance in a given year may be met through the use of unbundled RECs. For the Municipalities and Co-ops, no more than 50 percent of their compliance in a given year may be met through the use of unbundled RECs.

Discussion:

- All felt the commission should develop a renewable energy certificate program;
- Some felt that certificates should not have an expiration date and be banked for usage or transfer after the year in which they were created.

- Some indicated that to optimize the amount of cost effective renewable energy, the utilities should be allowed to purchase and sell renewable energy credits with the benefits used to offset the cost of the renewable resources.
- UREA felt it would be best not to impose a geographic limitation on where the RECs can be purchased.

Outcome: *Renewable Energy Certificates (RECs) should be used to measure compliance (consensus).*

E) Issuance of Certificates

Background: There is a need for an entity to issue and track RECs if a Utah RPS is established. One potential candidate for such tracking is the Western Renewable Energy Generation Information System (WREGIS). WREGIS is an independent, renewable energy tracking system for the region covered by the WECC. WREGIS tracks renewable energy generation from units that register in the system using verifiable data and creates renewable energy certificates (RECs) for this generation

STRAWMAN:

A statewide governing body will issue RECs and the tracking will be done by WREGIS.

Discussion:

- Some participants asked if a statewide governing body should oversee the certification of RECs using standards and tracking provided by WREGIS; it was noted that a statewide governing body likely cannot issue RECs, but could determine whether a project meets the portfolio standard's eligibility requirements.

Outcome: *TBD*

F) Existing Facilities

Background: Some states have limited facilities that qualify towards meeting an RPS to those that were built after a certain year. This is typically done in an effort to encourage the development of new renewable resources as opposed to relying on existing facilities. In some instances, existing facilities have been limited to exclude some types of facilities from qualifying.

STRAWMAN:

An existing facility is defined as those that became operational before January 1, 1995.

Discussion:

- Several participants noted that this is an arbitrary deadline and that Utah-specific parameters need to be considered before the issue of existing facilities/facility vintage can be adequately addressed.

Comment [Gms8]: DPU: This factor is important. Again, there needs to be a discussion about how in-state renewable resources are integrated in the policy. The impacts of implementing a given vintage date should also be explored in more detail before a policy is adopted.

Outcome: *Project eligibility needs to be determined and needs to address resource type, vintage (i.e. commercial operation date), and geographic location criteria (consensus).*

G) Renewable Energy Certificate Trading

Background: If a Utah RPS is established, there is a need to determine what types of RECs can be used, what geographic boundaries may apply, and how those RECs can be used in meeting the requirements on an RPS.

STRAWMAN – Renewable Energy Certificate Trading:

Electric utilities can use both bundled and unbundled RECs within the WECC. RECs may only be used once and only by the owner of the REC.

Discussion:

- It is important to establish a system that will ensure against double-counting.
- There may be opportunities to sell RECs if there are no interim hard targets; revenues from such sales are credited to customers which helps to reduce the cost of renewable energy resources..
- Many participants felt that targets should only apply to kilowatt-hours sold within Utah.
- Some suggested that incentives could be created for in-state renewable energy development if utilities were allowed to use unlimited amounts of unbundled RECs procured from in-state projects, with some restrictions placed on amounts of out-of-state unbundled RECs (i.e., the Oregon RPS).
- Some participants opposed geographic restrictions on resource procurement. The narrower the geographic restrictions placed on renewable resource eligibility criteria, the fewer options that will be available to satisfy the target; this can lead to more expensive projects, more costs to the consumer and/or fewer cost effective resources developed.

Comment [Gms9]: UAE: UAE: What is meant by this bullet point? Is the issue regulating sales in other states or whether RECs for resources located in another state or whose energy is delivered into another state should count toward compliance with a Utah RPS?

Outcome: *Before unbundled RECs can become a compliance mechanism, changes may need to be made to regulatory framework (consensus)*

Comment [Gms10]: RMP: "... to the existing utility regulatory framework"

H) Recovery of Costs**Background:** TBD**STRAWMAN:**

All prudently incurred costs associated with complying with the RPS are recoverable.

Discussion:

- Some noted that it is important to ensure that the rate-setting process results in all elements of cost being balanced and that costs and revenues are matched.
- Rocky Mountain Power noted that its renewable energy additions occur in multiple increments of approximately 100 megawatts each during the course of a year. These additions are capital intensive (currently over \$2 million per megawatt) but the energy cost after construction is nearly zero, providing a significant benefit to customers. Rocky Mountain Power stated that it was essential that customers see benefits and costs at the same time (i.e., that rates match costs and benefits). Rocky Mountain Power prefers an adjustment mechanism rather than a general rate case to achieve such matching, recognizing the multiple number of renewable energy additions in a year.
- Utility representatives emphasized prudently incurred costs to own, operate and construct renewable energy sources and associated assets should include transmission and other costs to acquire renewable energy (i.e., power purchases of qualifying electricity would be recovered in rates at the same time customers receive the benefits of the renewable energy);
- Utility representatives emphasized prudently incurred costs of acquiring renewable energy certificates should be recoverable in rates with any net revenues from sales of renewable energy certificates credited to customers;
- Some participants felt that prudently incurred costs of investigating and developing renewable energy sources (including siting, permitting, licensing and pre-construction costs) should be recovered by utilities.
- Some participants noted that that the tax credits that can make renewable resources more attractive in the marketplace cannot be used by electrical co-ops or municipal power entities; however, it was also noted that a right to sell or transfer the credits to other entities might mitigate this issue as well as encourage in-state project investment from out of state investors.
- Some noted that statutes and regulatory processes already exist to give cost recovery for prudently incurred costs, and that an RPS does not need to provide any new assurances, only refer to existing ones.
- It was noted that in the rural electric cooperative model, all costs are born by members/ratepayers.

Comment [Gms11]: UAE: "Other parties noted that for the same reasons, payment of all-in costs of a project in the years they are incurred should also be available to non-utility renewable and energy efficiency projects in order to promote development of the same."

Outcome: *Prudently incurred costs should be recoverable (consensus).*

I) Cost Caps

Background: TBD

STRAWMAN:

Utilities are not required to comply with the RPS to the extent that the sum of the incremental costs of compliance with the RPS, the costs of the unbundled RECs, and the alternative compliance payments made exceed four percent of a utility's annual revenue requirement in a compliance year. RPS compliance costs are not included in the annual revenue requirement to prevent a compounding effect.

Discussion:

- Rocky Mountain Power representatives emphasized that cost-effectiveness as defined in the law for integrated resource planning should be the economic criteria for meeting any target. They argue that penalty provisions are not needed and are unwise since weather, equipment problems, supplier shortages, availability of tax incentives and natural disasters will alter the economics of a renewable energy project.
- Utility representatives explained that a cost cap should not be necessary as long as satisfaction of any renewable energy target was conditioned upon it being cost effective. In fact, if a cost cap were imposed, it should allow the utility to exceed the cost cap if the utility could demonstrate that it was cost effective.
- CCS recommended that other states' models be considered regarding cost caps.
- UAE noted that four percent is an arbitrary amount taken from Oregon's RPS and that a cost cap more appropriate for Utah should be evaluated. In addition, they noted that four percent of the annual revenue requirement is a significant amount of money, approximately \$52M annually.

Outcome: *Cost caps should be established (consensus).*

Comment [Gms12]: RMP: "Cost caps are not necessary as long as satisfaction of any renewable energy target is conditioned upon it being cost effective."

J) Alternative Compliance Payments

Background: TBD

STRAWMAN:

In lieu of procuring renewable energy resources, utilities can pay an Alternative Compliance Payment (ACP) to be placed in a fund that can only be used for acquiring renewable energy resources in the future, or for energy efficiency and conservation programs. Rates for each utility will be established on a per megawatt-hour (MWh) basis by the Utah Public Service Commission (PSC). This mechanism sets an effective cap on the cost of complying with the RPS.

A state agency would calculate the ACP value in dollars per megawatt-hour, not the utility. The ACP mechanism helps to ensure that price gouging does not occur during negotiations between developers or sellers and buyers. In the event that renewable project prices rise above the ACP value, the utility would be allowed to defer investments until the market corrected itself.

Discussion:

- Rocky Mountain Power noted alternative compliance payments would not be necessary if renewables are added based upon cost-effectiveness
- CCS noted that any compliance payments are being paid by consumers and that any program must be designed such that consumers making the payments receive the benefits from those payments.
- Some noted that alternative compliance might also be achieved through reduction in consumption through demand-side management measures and energy efficiency.
- UAE felt that it is important that the PSC be able to closely oversee and monitor the ACP fund.
- UAE also noted if the statutes are changed to allow for ACPs and unbundled RECs, such changes need to be made with great care and in a manner that enables all parties to understand how statutory changes will affect acquisition of other, non-renewable, resources.

Outcome: *Before Alternative Compliance Payments (ACP) can become a compliance mechanism, changes may need to be made to regulatory framework (consensus)*

K) Green Power Programs for All Utilities

Background: TBD

STRAWMAN:

Every utility in Utah must offer their customers the option of voluntarily purchasing renewable energy. These purchases will not count toward an RPS.

Green power programs allow customers to purchase renewable energy above and beyond the RPS compliance level.

Discussion:

- Some felt that green power programs might be better addressed through rule-making.
- Public power entities felt that renewable resources from green power programs should be counted towards any targets or goals.
- Some felt that renewable resources from green power programs should not be counted towards targets in that it would create a disincentive for participating in such programs.

Outcome: *TBD*

L) Miscellaneous

Background: *TBD*

STRAWMAN:

By Oct 1, 2008, the state must establish an automatic adjustment clause method that allows timely recovery of costs prudently incurred by an electric company to construct or otherwise acquire facilities that generate electricity from renewable energy sources and for associated electricity transmission.

The RPS shall allow utilities to recover in the rates of all but the largest customers the costs of conservation measures.

Utilities and Independent Generators must submit annual compliance reports to the PSC or governing state-wide body.

Discussion:

- While the miscellaneous issues listed in this section could possibly be addressed in the regulatory arena rather than in legislation, some participants expressed a preference for the issues to at least be addressed at some level within legislation, thus providing specific guidance to regulators.
- Several parties argued the term “cost effective” should be defined consistently with the existing statutory criteria applied to integrated resource planning.
- It was noted that research needs to be done on how plants such as Bonanza and Intermountain Power Project should be addressed in an RPS. Significant amounts of power produced by those plants are delivered to customers outside Utah.
- CCS noted that it would be better to allow an automatic adjustment clause than to require it.
- CCS and UAE felt that the provision for conservation measure cost recovery in the rates of all but the largest customers should not be the starting point for a Utah RPS.

- Shoshone Energy felt that RMP resource procurement procedures and policies need further refinement in order to level the project development playing field and create true competition.
- Shoshone Energy felt that avoided cost calculations should be updated annually.
- Shoshone Energy felt that avoided costs should include IGCC as a resource alternative.
- Shoshone Energy felt that RMP should conduct annual renewable energy RFPs in order to meet RPS targets.

Outcome: *TBD*

CREDITS AND INCENTIVES

The REI focus group discussed various tax credits and incentives during their September 5, 2007 meeting. As the discussion progressed, it became apparent that a wide variety of different incentives or tax credits can be implemented that would encourage the development of renewable energy resources.

The focus group also agreed that incentives or credits should be implemented for a continuous period of time that will be consistent with the planning horizon and implementation schedule of the renewable resources that must be built to comply with any RPS targets.

Potential Credits and Incentives

- Increased production tax credits for in-state renewable energy generators
- Expansion of production tax credits or investment tax credit to cover concentrating solar.
- Increasing investment tax credit amounts/caps (current state caps are 25% up to \$2,000 for residential and 10% up to \$50,000 for commercial systems).
- Make current tax credits transferable so that non-profit agencies and governmental agencies can sell the credits for value to offset project costs
- Provide direct assistance to non-profits or local government agencies that cannot take advantage of tax credits
- Provide tax credits to companies for the development costs of large projects (esp. geothermal and wind)
- Provide “bonus” REC’s to utilities for in-state renewable energy used [i.e. for every kilowatt hour of energy generated from solar resources, the state would issues 2.4 (Nevada standard) kilowatt hours of renewable energy credits]
- Provide added incentives for locally-owned community-scale (i.e. up to 30 MW) renewable projects.

Comment [MSOffice13]: Suggested insertion by RMP

Comment [MSOffice14]: Suggested insertion by UCE

TRANSMISSION AND DISTRIBUTION SYSTEM

ACTIONS

Comment [MSOffice15]: Suggestion that we might want to a section for conclusions or recommendations at the end of this section.

In order to help the REI Focus Group to understand transmission and distribution system issues, Mr. Jim Tarpey of Holland and Hart gave a presentation on the Wyoming State Infrastructure Authority (WIA). See Appendix 7 for a summary of Mr. Tarpey's presentation.

Following Mr. Tarpey's presentation, the REI group discussed the following possible actions to help spur the development of transmission to serve renewable energy resources.

Establish a Utah infrastructure authority

When asked about how Utah might consider setting up an infrastructure authority, Mr. Tarpey suggested broad authority, a high level board appointed by the Governor, with a clear mission about whether the state is planning to be an import or an export state, the role of renewable energy resources, and whether the authority should be a state instrumentality with the associated separation from state government (which gives leverage and avoids the authority being seen as just another state agency).

Create Renewable Energy Development Zones.

Inadequate transmission infrastructure and siting delays and complications are two significant barriers to all new renewable energy development in Utah. Both of these hurdles maybe alleviated with the establishment of renewable energy development zones (REDZs) in Utah. The state could then establish streamlined, coordinated and expedited siting and transmission policies in REDZs. For example, Colorado and Texas each passed laws in 2007 to spur in-state renewable development by requiring: 1) the designation of renewable resource zones, coupled with transmission development plans to access the energy in those zones, and 2) the build out of transmission to bring the electricity out from the renewable resource areas.

Comment [MSOffice16]: Question by UCE: There are other transmission policy options to advance renewables. Such as New Mexico's RETA - Did the group decide that REDZ is the best option?

Comment [MSOffice17]: Suggested insertion by RMT: to add "provide funding" in this sentence

Comment [EW18]: Duplicate paragraphs re CRETI – I deleted the first set, since the second had its own heading.

Allow Cost Recovery for Transmission Development & Scoping Costs

Under Federal Energy Regulatory transmission rules and regulations renewable developers are responsible for the cost of interconnecting and integrating resources. This includes the cost of all studies.

Comment [MSOffice19]: Suggested alternative by RMP

California Renewable Energy Transmission Initiative

Rocky Mountain Power/PacifiCorp briefly mentioned developments occurring in California. The California Energy Commission (CEC), the California Public Utilities Commission (CPUC), California Independent System Operator (CAISO) and load-serving entities began in 2007 an initiative called the California Renewable Energy Transmission Initiative (CRETI). The CRET will build upon the work of the Tehachapi Collaborative Study Group, and identify and assess renewable resource zones in the state and develop coordinated, cost-effective resource development plans that could provide sufficient renewable electricity to California consumers by 2020 to meet AB 32 targets. The work of the CRET will take place over two years in three phases.

- 1) Statewide identification and assessment of competitive renewable energy zones.
- 2) Identification of priority REDZs and creation of conceptual transmission plans for these zones.
- 3) Development of Plans of Service (POS) for highest priority REDZs. These POS will provide detailed plans for transmission and infrastructure upgrades necessary to develop these zones but will not select specific transmission routes.
- 4) The state could utilize traditional economic development tools to pursue REDZs.

Comment [MSOffice20]: Suggested insertion by RMP

Create Incentives for a Smart Electrical Grid

In responding to questions about how to provide incentives for distributed renewable generation, Rocky Mountain Power/PacifiCorp replied that smart grid technology is the most likely enabler, since they would have a difficult time competing with the economics of utility-scale renewables. The group then discussed various considerations related to the smart grid, including:

Comment [MSOffice21]: This paragraph might be confusing

- The widespread deployment of low or no carbon distributed renewable generation resources, plug-in hybrid electric vehicles and end-use efficiency devices will require a “smart”, interactive grid and communication infrastructure.
- Today’s grid was designed to only transmit energy from source to the demand site and stands to benefit from the previous internet and computer boom and the current efforts in material sciences.
- A modernized grid would also improve operational security and allow increasing amounts of distributed renewable resources generated near load, which would reduce overall system losses and thus result in additional carbon savings.
- If plug-in hybrid electric vehicles become common place and solar distributed generation applications continue to increase, the energy grid must become more of a two-way operation where energy can be both delivered and received.

- Two-way flow of energy and data would also allow customers to respond to price signals to reduce usage at peak times, when the lowest efficiency fossil-fired units are operating.
- A range of technology exists today that can improve the grid such that reliability and efficiency is improved, and cleaner, distributed renewable energy resources are better integrated, including new smart meters, remote sensors, energy-management systems, better transmission lines, and advanced storage technologies that serve to optimize electricity generation, dissemination, and usage.
- Currently smart grid technology is not cost effective for the utilities to pursue. The utilities should be encouraged to review the potential on an ongoing basis.

Comment [MSOffice22]: Suggested insertion by RMP

Comment [MSOffice23]: •Alternative for bullet suggested by SEP:
“However, a smart grid system requires bi-directional communication meters for all individual ratepayers. Such meters cost @ \$2,000 per ratepayer. Whether such cost could be justified needs careful analysis.”

Create Incentives for a Energy Storage

Rocky Mountain Power/PacifiCorp had expressed a desire to discuss energy storage as an enabling technology for intermittent renewables, but there was insufficient time to do so. What follows below are the comments provided by Rocky Mountain Power/PacifiCorp to the REI co-chairs and DEQ staff.

The electricity sector has identified storage as having the distinct capability of enabling higher penetrations of variable output renewable energy in Utah’s energy portfolio. Other types of renewables – geothermal, biomass – are baseload resources and do not require storage. Some concentrating solar power projects will be built with heat storage to generate off-peak. The ability of electricity grids to absorb wind power has limits, which will be reached before the full potential of these sources is exhausted unless resources are added to firm, balance, and integrate intermittent renewables. Pumped water, compressed air, or battery storage can firm wind resources and therefore create energy that can be scheduled to match customer load base. In addition, storage provides emergency power supply and backup and remote area power supply. Coupled with advanced power electronics, storage systems can reduce harmonic distortions, and eliminate voltage sags and surges.

Storage technologies are particularly attractive for wind power, in effect overcoming the intermittent and frequently off-peak nature of wind power by storing the power, subsequently becoming a dispatchable power source that can be moved from the off-peak to the peak. Storage can firm wind capacity, and therefore avoid penalties for energy falling below the forecast, and utilize power above forecast. Wind energy then can increase its capacity credit, reduce grid connection rating, increase overall load penetration, and create profit maximization/price arbitrage. System operators and proponents of high wind energy penetrations recognize that energy storage systems can help mitigate the variability of intermittent resources, both for operating and capacity reserve needs. Storage can be on-site or centralized at utility facilities. Utility-scale

central storage is much cheaper than on-site storage, but it requires more transmission to take the intermittent resource to the storage site or to load.

Examples of energy storage and the status of their development are as follows:

- Flywheel storage – Good for good for smoothing short-term fluctuations.
- Pumped hydro – the most widespread energy storage system in use on power networks; large scale capacity, quick deployment, and can be particularly effective for wind resources with diurnal generation profiles.
- Compressed air energy storage (CAES) – used for reducing the parasitic load at a conventional power plant but not used to generate electricity directly.
- Batteries – older technologies are commercially viable; newer technologies are being tested:
 - a. Sodium-sulfur batteries (NaS) battery technology are being demonstrated at over 30 sites in Japan totaling more than 20 MW with stored energy suitable for 8 hours daily peak shaving. The current life of the batteries is about 15 years. The largest NaS installation is a 6MW, 8h unit for Tokyo Electric Power Company. Combined power quality and peak shaving applications in the U.S. market are under evaluation. American Electric Power (AEP) has been using a 1.2 megawatt NaS battery in Charlestown, West Virginia the past year and plans to install one twice the size elsewhere in the state next year. The costs are somewhat prohibitive, at \$2,500 per kilowatt, though costs are expected to come down within the next 10 years due to mass production.
 - b. Flow batteries are a special class of battery where electrolyte is stored outside the main power cell of the battery, and circulated through it by pumps, like a reversible fuel cell. Flow batteries can have relatively large capacities and are gaining popularity in grid energy storage applications.
- Thermal storage – thermal energy storage technologies store heat, usually from active solar collectors, both utility-scale and distributed technologies, in an insulated repository for later use in space heating, domestic or process hot water, or to generate electricity.
- While these technologies are currently not cost effective for the utility to pursue, consideration should be given to the role of the above technology in integrating resources over time.

Comment [MSOffice24]: Suggested insertion by RMP

APPENDIX 1: REI FOCUS GROUP PARTICIPANT LIST

The following individuals attended one or more of the REI Focus Group meetings. Meetings were open to the public, so attendance varied from meeting to meeting, and some individuals who were present might not have signed the attendance lists.

CoChair: Tim Wagner, Sierra Club

CoChair: Ernie Wessman, utilities consultant and Air Quality Board

Abdinasin Abdulle
Steven Aderholt, Sound Geothermal
Rick Allis, Utah Geological Survey
Renette Anderson, DEQ Public Affairs
Mike Avant, Garkane Energy
Joe Andrade, Utah Science Center
Lane Ashton, Raser Technologies
Sara Baldwin, Utah Clean Energy
Des Barker, DBA, Inc.
Michele Beck, Utah Committee of Consumer Services
Vicki Bennett, Salt Lake City Environmental Program Manager.
Jason Berry, State Energy Program
Ted Boyer, Public Service Commission
Alyson Brennan, VP Political Advocacy UWABC
Gary Bryner, Brigham Young University
Jim Byrne, West Wind Wires
James Campbell, Utah Division of Air Quality
Patrick Clark, Staker Parsons
Caitlin Collins, Utah Association of Energy Users
Cathryn Collis, SWCA Environmental Consultants
David Curtiss, EGI University of Utah
Jamie Dalton, Utah Division of Public Utilities
Ron Daniels, State Energy Policy Coordinator
Kyle L. Davis, PacifiCorp/Rocky Mountain Power
Jennifer de Tapia, Student
Hans Ehrbar
Stephen Foerster, Student
Naomi Franklin, League of Women Voters
Jordan Gates, Salt Lake City
Rick Gilliam, Sun Edison
Steve Graham, Utah Community Reinvestment Corporation
Cheryl Heying, Utah Division of Air Quality
Keith Hill, Deseret Power
Jim Holtkamp, Holland and Hart

Renewable Energy Initiative Focus Group
Draft Report – October 12, 2007, 2007
Mavion Horna, MJH Power Consulting
Carol Hunter, Rocky Mountain Power/PacifiCorp
Andy Huttgren, Environmental Performance Group
Susan Innis, Western Resource Advocates
Tom Jepperson, Questar
Kelly Knutsen, Utah Clean Energy
Chris Lilley, Kennecott Utah Copper
Nykole Littleboy, Division of Air Quality
Sam Liu, Utah Division of Public Utilities
Tracy Livingston, Wasatch Wind
Alexander Lofft, **Principal & Broker Corporate Real Estate Group, LLC**
Tim Loftis, Morgan Stanley
Douglas Maxfield, Roan Power
Al McKee, Bureau of Land Management
Geoff McNaughton, Division of Forestry , Fire and State Lands
Michael Mendelsohn, Western Resource Advocates
Steven Michel, Western Resource Advocates
Cheryl Murray, Committee of Consumer Services
Dianne Nielson, Governor Huntsman's Energy Policy Advisor
John Njord, Utah Department of Transportation
Ann Ober, Salt Lake County
Dave Olive, Shoshone Energy
Russ Olsen, Kennecott Utah Copper
Randy Parker, Utah Farm Bureau
Leon Pexton, Utah Municipal Power Agency
Mike Peterson, Utah Rural Electric Association
Ben Phillips, Emery Energy
Artie Powell, Utah Division of Public Utilities
Phil Powlick, Stake Energy Program
Greg Probst, enXco
Pepper Provenzano
Ted Rampton, Utah Associated Municipal Power Systems
Kirt Rhoades, Geo Engineers
Lisa Romney, Chevron Energy
Brenda Salter, Utah Division Public Utilities
Andy Schoenberg, Utah Population and Environment Coalition
Richard Simon, V-Bar
Glade Sowards, Division of Air Quality
Rick Sprott, Department of Environmental Quality Executive Director
Brad Stevens, Utah Solar/Green Power
Jim Tarpey, Holland and Hart, LLP
Roger Tew, Utah Associated Municipal Power Systems
Mark Thomas, M. D. Thomas Consulting
Todd Thorner, Foresight Wind
Kent Udell, University of Utah Mechanical Engineering
Kathy VanDame, Wasatch Clean Air Coalition

Renewable Energy Initiative Focus Group
Draft Report – October 12, 2007, 2007
Christy White, RAAM Power
Becky Wilson, Utah Public Service Commission
Carol Withrow
Betsy Wolf, Salt Lake Community Action Program
Sarah Wright, Utah Clean Energy
Joni Zenger, Utah Division of Public Utilities
Marelynn Zipser, League of Women Voters
Renee Zollinger, Environmental Performance Group

DRAFT

APPENDIX 2: LIST OF PRESENTATION AND DISCUSSION TOPICS

In order to develop a shared understanding of renewable resources and the issues affecting their development, the REI group met several times in July and early August to hear presentations and discuss aspects of the following topics:

- The options identified by the Climate Change Stakeholder Working Group's Energy Supply Sector subgroup
- Utah's renewable energy landscape, presented by Philip Powlick of the State Energy program
- An overview of Renewable Portfolio standards, including an introduction to state experience and possible cost impacts, prepared for the CCSWG by Ryan Wiser of the Lawrence Berkeley National Labs
- Comparisons of Congressional global warming bills, prepared by Amy Royden-Bloom, National Association of Clean Air Agencies
- A discussion of the nature of an electrical "smart grid,": presented by James Campbell of UDAQ staff
- Review of renewable initiatives in various western states, presented by James Campbell
- Presentation on utility avoided costs, presented by Becky Wilson of the Utah PSC staff
- Presentation on barriers to solar energy development, presented by Sarah Wright of Utah Clean Energy
- Presentation of geothermal project development hurdles, by Richard Goff of PacifiCorp
- A case study of the Oregon Renewable Portfolio Standard and other supporting legislation, presented by Kyle Davis of PacifiCorp
- Discussion of questions to address when considering a renewable portfolio standard, presented by Kyle Davis of PacifiCorp
- Wyoming State Infrastructure Authority (WIA) presentation by Mr. Jim Tarpey of Holland and Hart. See Appendix 7 for a summary of Mr. Tarpey's presentation.
- Presentation on barriers to wind energy development, presented by Tracey Livingston of Wasatch Wind, Inc.

In addition, on September 20, the State Energy Program presented the results of an evaluation requested for the REI to determine the technical and economic potential for renewable resources in Utah.

All of the above presentation handouts and other written materials will be available until - _____ on the REI Focus Group web site at <http://www.deq.utah.gov/Issues/REIFG/index.htm>, or available by contacting the Director of the Utah Division of Air Quality.

APPENDIX 3 – SUBGROUP DISCUSSION

SUMMARIES

Definition of Renewables Subgroup

Cost Effectiveness Subgroup

A subgroup was formed to discuss the meaning of “cost effective” as it should be applied to the development of renewable energy resources. Utilities generally must show, either to the Utah Public Service Commission in the case of investor owned utilities, or to various government entities or boards in the case of public power agencies, that investments are prudent and have been made in the best interest of the utility’s customers. Further, investor-owned utilities are required to file integrated resource plans every two years with the Commission. In these filings, the utility considers costs and operating attributes associated with various resource alternatives, as well as the performance of resource alternatives under different risk analysis scenarios. Using this process, the utility proposes its future expansion plan for new resources by demonstrating which resource alternatives result in the lowest cost and risk for its future revenue requirements.

Comment [MSOffice25]: Suggested insertion by Michele Beck

Mr. Artie Powell of the Utah Division of Utilities presented some information on Least Cost/Least Risk as it applies to PacifiCorp’s IRP planning process on August 15, 2007. His presentation is reproduced on the following pages of this appendix.

APPENDIX 4 – 17 QUESTIONS TO ADDRESS WHEN CONSIDERING AN RPS

Utah Renewable Energy Initiative August 2, 2007
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*Excerpts from testimony offered by Brent E. Gale, Sr. Vice President, Regulation and Legislation,
MidAmerican Energy Holdings Company to the Utah Legislature's Public Utilities and Technology (PUT)
Interim Committee on June 20, 2007*

Questions to address when considering a Renewable Portfolio Standard (RPS):

1. What is the purpose that the state wants to accomplish?
2. Is a mandate necessary or is it sufficient to set targets and remove statutory and regulatory impediments?
3. If a mandate is imposed, will it be reconciled with state standards regarding cost effectiveness?
4. How will consumers' interests be protected?
5. How should benefits and costs be passed on to customers and through what mechanism?
6. Will RPS targets be based on nameplate capacity or retail sales?
7. What ultimate percentage of renewable energy should be achieved by what date, and what, if any, interim benchmark goals should be established?
8. Should the details be developed in legislation or delegated to a regulatory agency?
9. Which resources qualify as "renewable energy" and what limitations, if any, will be placed on the use of these resources for compliance?
10. Through what means can an electric utility comply with an RPS; e.g., ownership of renewable generation, purchase of renewable energy, purchase of renewable energy credits (RECs), alternative compliance payments (ACPs), penalties in lieu of compliance?
11. What restrictions would be placed on an electric provider's ability to use RECs to comply with an RPS?
12. With regard to facility vintage, which generating facilities count toward compliance with the RPS?

13. With regard to geographic eligibility, will limitations be established for use of qualifying generation and RECs for compliance?
14. Would the same RPS requirements apply equally to all retail electric providers, or would requirements vary based on a provider's market share?
15. Under what circumstances will a utility be granted an exemption from compliance with RPS requirements?
16. Should there be penalties for an electric provider's failure to comply with RPS?
17. What considerations should be given to the establishment of a State RPS to provide for maximum compatibility with a prospective Federal RPS?

Specific RPS Design Elements that Will Affect Compliance Costs:

- Percentage targets and timeframes
- Resource eligibility
- Geographic eligibility and delivery requirements
- Set asides for solar or other resource types
- Flexible compliance mechanisms (RECs, banking, borrowing, settlement periods)
- Encouragement for long-term contracting

Resource/Project "Cost Effectiveness" Cost Cap Mechanisms in Use in Other RPS States:

- **Codification of Risk-Adjusted, Least-Cost Standard**
 - Oregon
- **Bundled Contract Price Caps**
 - New Mexico, Hawaii, Montana
- **Alternative Compliance Payments** (*freely available*)
 - Massachusetts, New Jersey, Rhode Island
- **Alternative Compliance Payments** (*available/recoverable in rates if least cost measure and/or insufficient available renewable energy*)
 - Delaware, District of Columbia, Maryland, Oregon

Overall RPS Program Compliance Cost Cap Mechanisms in Use in Other RPS States

- **Retail Rate/Revenue Cost Cap**
 - Colorado, New Mexico, Oregon, Washington
- **Financial Penalty** (*for competitive suppliers, will act as cost cap*)
 - Connecticut, Texas, Oregon, Pennsylvania
- **Customer-Class Bill Impact**
 - New Mexico, Maryland, Delaware, Maine
- **Renewable Energy Fund Limitation**
 - Arizona, California, New York
- **Force Majeure Clauses**

- Pennsylvania, Minnesota, Nevada, Maine, Oregon, etc.

OREGON RPS CASE STUDY

The following pages contain the case study of the Oregon RPS and related legislation was presented to the REI Focus Group, and used by that group as an efficient way to understand and consider the various design features that could possibly be useful in a Utah RPS. The case study was prepared by Kyle Davis of PacifiCorp, part of Mid American Energy Holdings Company.

[insert the pdf version of the case study]

APPENDIX 5 – TAX CREDITS AND INCENTIVES

The REI Focus Group reviewed the following tax credits and incentives that have been enacted at the Federal level, or used in one or more Western states:

Current Incentives for Renewable Electricity

Federal Incentives

1. Renewable Energy Production Tax Credit: 1.9 cent/kWh tax credit for electricity generated by wind, solar, closed-loop biomass, and geothermal resources. Cannot be used with the Solar and Geothermal Business Tax Credit and sunsets December 31, 2008.
2. Solar and Geothermal Business Tax Credit: 10% for geothermal and 30% for solar for commercial or industrial facilities using solar or geothermal technologies.
3. Farm Bill Grant, Section 9006: For energy efficiency and renewable energy projects by agricultural producers and small businesses in rural areas – not historically utilized in Utah – only one previous award. applicant cost share may be a deterrent, capped at \$500,000.
4. Residential Solar and Fuel Cell Tax Credit: 30% up to \$2,000 for solar electric. Sunsets December 31, 2007.
5. Modified Accelerated Cost-Recovery System (MACRS): Businesses can recover investments in certain property through depreciation deductions.
6. Clean Renewable Energy Bonds (CREBs) [2007 awards have been made, but congress has not yet passed funding beyond this FY]: financing mechanism for public sector renewable energy projects 0% interest rate, the borrower pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest.

State Incentives - Utah

1. Renewable Energy Systems Tax Credit: State tax credit for residential (25% up to \$2,000) and commercial (10% up to \$50,000 or PTC for wind, biomass and geothermal over 600kW of 0.35 cents/kWh during first 4 years for systems from 2007 forward) renewable energy systems. PTC cannot be used in conjunction with the investment credit.
2. Renewable Energy Sales and Use Tax Exemption: State sales tax exemptions for the purchase or lease of equipment used to generate electricity by a renewable energy production facility with generation capacity of 20kW or greater. Sunsets June 30, 2009.
3. Net Metering Program: requires all electric utilities and cooperatives (municipal utilities are excluded) to allow customers to connect renewable energy systems to the grid for their own use and to supply excess electricity to the electric grid. The utility will "net"

Draft Report – October 12, 2007, 2007

the customer's electricity use and production over the monthly billing period, in essence, paying the customer retail price for the electricity they produce. If net metering results in excess customer-generated electricity over the billing period, the utility will credit the customer for the electricity at the avoided cost rate – i.e., the cost the utility would otherwise incur to generate power if it did not purchase electricity from another source. System size capped at 25 kW.

4. Solar Easements: Rights to sunlight access attached to property rights

Other Incentives for Renewable Electricity (from neighboring and other states)

Listed on www.dsireusa.org

1. *Solar Rebate/Buydown Programs (examples of participating states: WY- 50% up to \$3,000, CO – many - Rebates for grid-tied PV systems are offered at \$2.00 per watt, up to \$6,000, AZ – many, OR – buydown – Res:\$2.00/W-DC to \$2.25/W-DC- \$10,000 cap, Com: \$1.50/W-DC to \$1/W DC- \$57,000-\$70,000 cap, FL - Res - \$20,000/ Com- \$100,000, very common idea often funded by a Public Benefit Fund: see #12)

**This is something that PacifiCorp is currently testing out, beginning this year, in a small pilot project of 107 kW/year at \$2/watt.*

2. Tax credit/deduction increases (examples of participating states: ID – deduction - 40% up to \$5,000/year, \$20,000 total, OR – credit -Very aggressive business energy tax credit –35% up to \$10,000,000 over 5 years, 50% for RE generating facilities, \$9,000 for single family homes – Residential credit caps at \$6,000)

3. Green Tag Purchase

Example: The Northwest Solar Cooperative (NWSC) offers to purchase the rights to the environmental attributes or “Green Tags” derived from grid-connected solar PV- or wind-generated electricity at a rate of \$0.05/kWh through December 31, 2009 (examples of participating states: ID, OR, NV- portfolio energy credit trading program)

4. Low or Zero Interest Loans (examples of participating states: ID - Res: \$15,000, Com: \$100,000, 4% interest, 5 years, generating projects not eligible, 0% interest for heat pump, OR - Small scale RE loans - Typically \$20,000 - \$20 million)

5. Grants (example of participating states: OR - RE grants: large scale, generating projects preferred, ID - RE grants: large scale, generating projects preferred)
Solar for Schools (examples of participating states: OR, ID)

6. Bond program (examples of participating states: ID, NM - Projects financed with the bonds will be paid back to the bonding authority using the savings on energy bills, state government and school district buildings)

7. Property Tax Exemptions (examples of participating states: CO, AZ)

8. PV leasing Program for PV water pumps (example of participating state: TX)
9. Building Permit Fee Credit (Exemption) for Solar (example of participating state: AZ – up to \$1,000)
10. Mandatory Utility Green Power Option - All electric utilities are required to offer green power options to their customers (examples of participating states: CO, NM, MT, WA).
11. Permitting Standards
12. Public Benefit Funds/Trusts
13. Renewable Energy Zones –developed to instigate siting and construction of transmission to facilitate electric output from renewable energy technologies (example – TX – Competitive Renewable Energy Zones (CREZs).

APPENDIX 6 – WYOMING INFRASTRUCTURE AUTHORITY

The WIA is set up as a state instrumentality; in a way that the state is not pledging full faith and credit on bonds issued by the authority a necessary condition to address Wyoming constitutional issues. Even with that limitation, the WIA scope is very broad, with essentially cradle to grave authority to build and strengthen the transmission system, inside or outside the state. WIA can partner with the private sector, and has bonding capability up to \$1 billion on projects it doesn't own, and unlimited for projects owned by WIA.

The WIA has found that its most effective role is that of facilitator to help get the right players to the table, to serve as a catalyst/coordinator, advocate, or project sponsor. Much of its budget is used to fund feasibility studies that will help participants decide whether to build a transmission line. The WIA works with project partners to complete the studies. If the parties decide to proceed, the intent is to recover the Authority's costs so that the money can be re-used. Major partners would take the major lead going forward. Major projects facilitated by WCI include the Wyoming-Colorado Intertie Project, the Trans West Express, the Frontier Project, and the IGCC Pilot Project.

Some of the challenges that the WIA faces include the need to engage many different stakeholders with very different agendas; engineering challenges including technology, terminal locations, suitable corridors, and the impact on the rest of the grid; environmental and permitting issues; financing; the breadth and depth that should be included in the feasibility studies; equity financing during the development stage; and risk allocation and certainty of the revenue stream during the construction stage.

Public policy challenges include the use of a regional approach to transmission planning and development rather than individual states doing their transmission planning independent of other states or regional needs, the coordination of state and federal regulatory commissions, and coordinating for site approval processes.

Also, there are challenges concerning the application of open meetings laws and the Public Records Act, and the impact those requirements have on the willingness of participants to share confidential, proprietary or market-sensitive information.

The WIA is not required to comply with the Wyoming State procurement policy processes.